

Attribute: Temp

Values (Temp) = Hot, Mild, Cool

$$S_{Rain} = [3+, 2-] \quad Entropy(S_{Sunny}) = -\frac{3}{5} \log_2 \frac{3}{5} - \frac{2}{5} \log_2 \frac{2}{5} = 0.97$$

$$S_{Hot} \leftarrow [0+, 0-] \quad Entropy(S_{Hot}) = 0.0$$

$$S_{Mild} \leftarrow [2+, 1-] \quad Entropy(S_{Mild}) = -\frac{2}{3} \log_2 \frac{2}{3} - \frac{1}{3} \log_2 \frac{1}{3} = 0.9183$$

$$S_{Cool} \leftarrow [1+, 1-] \quad Entropy(S_{Cool}) = 1.0$$

$$Gain(S_{Rain}, Temp) = Entropy(S) - \sum_{v \in \{Hot, Mild, Cool\}} \frac{|S_v|}{|S|} Entropy(S_v)$$

$$Gain(S_{Rain}, Temp)$$

$$= Entropy(S) - \frac{0}{5} Entropy(S_{Hot}) - \frac{3}{5} Entropy(S_{Mild})$$

$$- \frac{2}{5} Entropy(S_{Cool})$$

$$Gain(S_{Rain}, Temp) = 0.97 - \frac{0}{5} 0.0 - \frac{3}{5} 0.918 - \frac{2}{5} 1.0 = 0.0192$$

Atlas wind is the last node

